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UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

R-RM
COOPERATION
FIARBC
Mo. Basin

MISSOURI RIVER BASIN
FLOOD CONTROL SURVEY REPORT

SUPPLEMENTAL DATA ON PROGRAM

SOUTH PLATTE WATERSHED
ABOVE KERSEY, COLORADO

Prepared by
Intermountain Forest & Range Expt. Station
U. S. Forest Service
Ogden, Utah

1948-49

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RIFC
MISSOURI BASIN
Program in Forest Service area responsibility

The attached tabulations have been prepared by the Flood Control Division of the Intermountain Forest and Range Experiment Station from field survey data for the area covered by this station in the Missouri River Flood Survey. Map No. 1 attached indicates the watershed areas to which these program sheets apply. The symbols H-1, F-7, H-5a designate physical land units set up by the Soil Conservation Service for the recently completed over-all Missouri River Survey which includes the items in these tabulations.

The program has been tabulated in four phases which are shown on three sheets. Sheet 1 contains A measures (structural), sheet 2 contains B measures (vegetative), and sheet 3 contains facilitating measures and a summary of the three aspects of the program.

These tabulations have been compiled for the following watershed or land areas: (1) South Platte above Kersey, Colo.; (2) North Platte above Pathfinder Reservoir, Wyo.; (3) Laramie River above Ft. Laramie, Wyo.; (4) Black Hills. In addition, programs have been compiled for the Nebraska N. F. (1 sheet), Plains Prairie stream bottom woodlands (1 sheet), and Shelterbelt (1 sheet).

The following explanation of computations contained in A and B measure sheets is included to facilitate interpretation of the programs.

Explanation of Computations - "A" Measures

1. Installation and maintenance during installation period.

   a. Installation period - 4 years.
   b. Maintenance during installation period - 4% of base costs.
   c. Maintenance after installation - Rate indicated in Column 23 applied to base installation costs.
   d. Program coordination - distributed proportionally among Federal agencies on basis of total installation costs for each.
   e. Program evaluation - distributed proportionally among land ownership groups on basis of total installation costs for each.
   f. Technical assistance - distributed proportionally by total installation costs for land ownership groups by groups of measures as follows:

      Group 1, 2 - 25%
      4 - 25%
      5 - 25%
      6 - 10%
      7 - 10%
      8 - 13%
      9 - 13%

   g. Criteria determination: distributed proportionally on basis of program costs by land ownership groups.

2. Cost allocation: Total installation costs distributed by measure groups as follows:

Group 1,2 -	Fed.	Govt.	bears	100%	on	Fed.	lands	and	90%	on	public	and	private.
4 -	"	"	"	"	"	"	"	"	85%	"	"	"	"
5 -	"	"	"	"	"	"	"	"	90%	"	"	"	"
6 -	"	"	"	"	"	"	"	"	50%	"	"	"	"
7 -	"	"	"	"	"	"	"	"	60%	"	"	"	"
8 -	"	"	"	"	"	"	"	"	60%	"	"	"	"
9 -	"	"	"	"	"	"	"	"	60%	"	"	"	"

Facilitating measures Government bears 100% of cost.

3. Annual maintenance after construction: Computed by applying a percentage figure by group measures to base installation costs. Percentage figures used by groups were as follows:

Groups 1 and 2 - 1/4 of 1%
3-8 - 1/2 of 1%

4. Total annual installation costs: Computed by dividing total installation costs including maintenance during construction by the life expectancy by group measures as follows:

Group measure	Life expectancy
1	50 years
2	25 "
3	25 "
4	50 "
5	33-1/3 "
6	25 years
7	25 "
8	25 "
9	33-1/3 "
Facilitating measures	50 "

5. Total annual maintenance costs: Computed by applying annual maintenance rate (Column 23) after construction to base installation cost.

Explanation of computations - "B" Measures (South Platte only)

Installation period - 30 years
Maintenance during installation period - product of annual maintenance rate and base installation cost by ownership groups times 14.5 gives maintenance during installation period.
Total installation costs:- The sum of base installation costs and maintenance during the installation period.
Annual maintenance - Product of annual maintenance rate (Column 23) and base installation groups by land ownership groups.
Allocation of costs - The Federal Government bears all costs for measures installed on Federal lands and 10% of the cost of all measures on public and private lands except for the following exceptions:

Fire control on range lands and increased fire protection on forests and woodlands - Federal Government bears 100% of costs on Federal lands and 50% of costs on public and private lands.
Terrace spillways - Costs are 100% Federal on all lands.
Terraces pasture - Federal Government bears all costs on Federal lands and 40% of costs on public and private lands.
Technical assistance - Federal Government bears 100% of costs on all lands.
Stock driveways - Federal Government bears 100% of costs on all lands.

The Federal Government bears no costs on public and private lands for the following measures:

Openland
Reseeding (Irrig.)
" (Dry)
" (Range)
Rodent Control - F-7
Waterways (grass)
Terraces - Seed (Dry)
Stock Water Dams
Wells
Spring Development F-7
Fencing F-7
Contour Planting
Farm Drains
Fertilizing
Improvements on irrigated land
Meadow improvement

Maintenance costs after installation are distributed on the basis of land ownership except fire protection.

Annual Costs: Installation annual costs are 2 percent of the total installation costs. Annual maintenance costs are the total annual maintenance (Column 28) obtained by applying the annual maintenance rate (Column 23) to total installation costs.

UPPER PLATTE RIVER BASIN

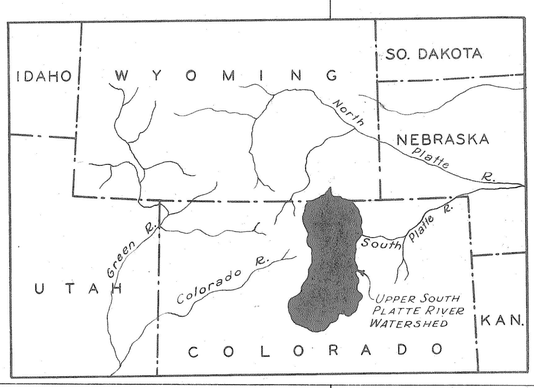
MISSOURI RIVER BASIN

WYOMING & COLORADO

LEGEND

- Boundary Platte Basin
- Boundary F.S. Area Interest
- Boundary National Forest
- Physical Land Unit Boundary

Scale in miles
1 : 1,000,000



LOCATION MAP

100 50 0 50 100 200 MILES
SCALE

LEGEND

- WATERSHED BOUNDARY
- CHERRY CREEK WATERSHED BOUNDARY
- COUNTY BOUNDARY LINE
- NATIONAL FOREST BOUNDARY LINE
- RAILROAD
- 40 U. S. NUMBERED HIGHWAY
- PAVED OR OILED HIGHWAY
- IMPROVED ROADS
- COUNTY SEAT
- STATE BOUNDARY LINE
- INCORPORATED TOWN

SCALE
1 0 1 2 3 4 5 MILES

T. 14 N.
T. 1 N.
T. 1 S.
R. 78 W.
R. 71 W.
R. 66 W.

ROOSEVELT NATIONAL FOREST
ARAPAHO NATIONAL FOREST
PIKE NATIONAL FORESTS
SOUTH PARK

ALBANY CO. WYOMING LARAMIE CO.
LARIMER CO. COLORADO
CLEAR CREEK CO. PARK CO. JEFFERSON CO. BOULDER CO. GILPIN CO. WELD CO. ADAMS CO. ARAPAHOE CO. DOUGLAS CO. ELBERT CO. DOUGLAS CO. TELLER CO. EL PASO CO.

VIRGINIA DALE
LIVERMORE
RUSTIC
EGGERS
WELLINGTON
FORT COLLINS
PIERCE
EATON
WINDSOR
GREELEY
EVANS
KERSEY
LASALLE
JOHNSTOWN
MILLIKEN
GILCREST
PLATTEVILLE
LOVELAND
BERTHOUD
GLEN HAVEN
ESTES PARK
CAMERON PASS
LYONS
HYGIENE
LONGMONT
ALLENSPARK
RAYMOND
JAMESTOWN
BEAVER RES.
WARD
NAVAJO PEAK
ROLLINSVILLE
NEDERLAND
BOULDER
LAFAYETTE
LOUISVILLE
BRIGHTON
ERIE
FT. LUPTON
BLACKHAWK
CENTRAL CITY
IDAHO SPRINGS
GEORGETOWN
SILVER PLUME
BERTHOUD PASS
GOLDEN
ARVADA
CITY & COUNTY OF DENVER
MORRISON
EVERGREEN
CONIFER JCT.
LITTLETOWN
ENGLEWOOD
PARKER
SEDALIA
FRANKTOWN
CASTLE ROCK
DECKERS
WOODLAND PARK
PALMER LAKE
GRANT
BAILEY
SO. PLATTE
JEFFERSON
COMO
ALMA
FAIRPLAY
HARTSEL
ANTERO RESVR.
CONIFER
TWIN CONIFER
DIVIDE
GRANITE HILLS
MANITOU EXP. STATION
Manitou Park

Dale Cr.
Fish Creek
Sand Creek
Boxelder Cr.
Rawhide Cr.
Coal Creek
Douglas Lake
Terry L.
Soldier Cr.
Redstone Cr.
Buckhorn Creek
Miller Fork
Sheep Creek
Eaton R.
George Creek
Bull Creek
North Fork
Mid. Fk.
South Fk.
Rabbit Cr.
Park Creek
Redfeather Lakes
North Lone Pine Cr.
So. Fork Lone Pine Cr.
Elkhorn Cr.
Bennett Creek
Little Beaver Cr.
Beaver Cr.
Chambers Lake
Comanche Resvr.
Long Draw Resvr.
Joe Wright Resvr.
Miller Fork
Cow Creek
Milner Pass
Fall River
Thompson River
Lone Tree Resvr.
Dry Cr.
Thompson
Meadow Cr.
Buckhorn Resvr.
Lake Loveland
Collamwood Cr.
Douglas Lake
Terry L.
Soldier Cr.
Redstone Cr.
Buckhorn Creek
Spring Cr.
Coal Creek
Lone Pine Cr.
Redfeather Lakes
Elkhorn Cr.
Little Beaver Cr.
Bennett Creek
Chambers Lake
Comanche Resvr.
Beaver C

TOTAL ACREAGE: 5,863,040

ESTIMATED PROGRAM COSTS IN DOLLARS -- SOUTH PLATTE WATERSHED ABOVE KERSEY, COLORADO

Revised 11/15/48

"A" MEASURES

PROGRAM MEASURES	Unit	Average unit cost	NUMBER OF UNITS: N. F.	Other Federal	Public	Private	Total	INSTALLATION COST: BASE INSTALLATION COST: N. F.	Other Federal	Public	Private	Total	INSTALLATION COST: MAINTENANCE-INSTALLATION: N. F.	Other Federal	Public	Private	Total	TOTAL INSTALLATION COSTS: Other Federal	Public	Private	Total	ANNUAL MAINTENANCE COSTS: Rate	N. F.	Other Federal	Public	Private	Total	ALLOCATION OF COSTS: INSTALLATION: Federal	Public	Private	MAINTENANCE: Federal	Public	Private	TOTAL ANNUAL COSTS: Installation	Maintenance	Total
COLUMN NO.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
									8+9+10+11									13+14+15+16									24+25+26+27									Col. 28	Col. 28	
1. Detention and Retention Structures																																					
a. Detention	Each	150,000	77	--	4	39	120	12,320,000	4-	640,000	6,240,000	19,200,000	498,800	--	25,600	249,600	768,000	12,812,800	--	665,600	6,489,600	19,968,000	.0025	30,800	--	1,600	15,600	48,000	19,252,480	66,560	648,960	30,800	1,600	15,600	399,360	48,000	447,360
b. Retention	Each	44,000	4	2	2	48	56	176,000	88,000	88,000	2,112,000	2,464,000	7,040	3,520	3,520	84,480	98,560	183,040	51,520	91,520	2,196,480	2,562,560	.0025	440	220	220	5,280	6,160	2,333,760	9,152	219,648	660	220	5,280	51,251	6,150	57,411
c. Detention (Medium)	Each	6,600	63	31	29	729	852	415,800	204,600	191,400	4,811,400	5,623,200	14,632	8,184	7,656	192,456	224,928	432,432	212,784	199,056	5,003,856	5,848,128	.0025	1,040	511	478	12,029	14,058	5,327,838	19,905	500,385	1,551	478	12,029	116,963	14,058	131,021
Sub Total								12,911,800	292,600	919,400	13,163,400	27,287,200	514,472	11,704	36,776	526,536	1,091,488	1,628,024	304,304	955,176	13,685,936	28,378,688		32,280	731	2,298	32,909	68,218	26,914,078	95,617	1,368,993	33,011	2,298	32,909	567,574	68,218	635,792
2. Sediment Retention Structures																																					
a. Desilting Structures	Each	30,000	53	6	4	17	80	1,590,000	180,000	120,000	510,000	2,400,000	63,600	7,200	4,800	20,400	96,000	1,663,600	187,200	124,800	530,400	2,496,000	.0025	3,975	450	300	1,275	6,000	2,430,480	12,480	53,040	4,425	300	1,275	99,840	6,000	105,840
b. Debris Basins	Each	5,000	36	--	1	18	55	180,000	--	5,000	90,000	275,000	7,200	--	200	3,600	11,000	187,200	--	5,200	93,600	286,000	.0025	450	--	12	225	687	276,120	520	9,360	450	12	225	11,440	687	12,127
Sub Total								1,770,000	180,000	125,000	600,000	2,675,000	70,800	7,200	5,000	24,000	107,000	1,840,800	187,200	130,000	624,000	2,782,000		4,425	450	312	1,500	6,687	2,706,600	13,000	62,400	4,875	312	1,500	111,280	6,687	117,967
3. Flood Ways																																					
4. Channel Improvements																																					
a. Enlargements	Mile	3,157	13	6	6	150	175	41,041	18,942	18,942	473,550	552,475	1,641	758	758	18,942	22,099	42,682	13,700	19,700	492,492	574,574	.005	205	95	95	2,368	2,763	497,745	2,955	73,874	300	95	2,368	11,491	2,763	14,254
b. Stabilizing Structures	Each	5,000	3	1	1	30	35	15,000	5,000	5,000	150,000	175,000	600	200	200	6,000	7,000	15,600	5,200	5,200	156,000	182,000	.005	75	25	25	750	875	157,320	780	23,400	100	25	750	3,640	875	4,515
c. Rip Rapping	Mile	23,300	3	1	1	28	33	69,900	23,300	23,300	652,400	768,900	2,796	932	932	26,096	30,756	72,696	24,232	24,232	678,496	799,656	.005	350	116	115	3,262	3,844	694,247	3,635	101,774	466	115	3,262	15,993	3,844	19,837
d. Stream Bank Planting	Mile	200	157	18	11	49	235	31,400	3,600	2,200	9,800	47,000	1,256	144	88	392	1,880	32,656	3,744	2,288	10,192	48,880	.005	157	18	11	49	235	47,008	343	1,529	175	11	49	978	235	1,213
e. Improve Spillway, Channel Res.	Each	5,000	6	3	3	72	84	30,000	15,000	15,000	360,000	420,000	1,200	600	600	14,400	16,800	31,200	15,600	15,600	374,400	436,800	.005	150	75	75	1,800	2,100	378,300	2,340	56,160	225	75	1,800	8,736	2,100	10,836
f. Improve Irrigation Diversion Dams	Each	2,000	25	12	11	286	334	50,000	24,000	22,000	572,000	668,000	2,000	960	880	22,880	26,720	52,000	24,960	22,880	594,880	694,720	.005	250	120	110	2,860	3,340	602,056	3,432	89,232	370	110	2,860	13,894	3,340	17,234
g. Irrigation Ditch Crossings	Each	1,500	13	6	6	150	175	19,500	9,000	9,000	225,000	262,500	780	360	360	9,000	10,500	20,280	9,360	9,360	234,000	273,000	.005	98	45	45	1,125	1,313	236,496	1,404	35,100	143	45	1,125	5,460	1,313	6,773
h. Channel Improvement Structures	Mile	2,000	31	4	2	10	47	62,000	8,000	4,000	20,000	94,000	2,480	320	160	800	3,760	64,480	8,320	4,160	20,800	97,760	.005	310	40	20	100	470	94,016	624	5,120	350	20	100	1,955	470	2,425
Sub Total								318,841	106,842	99,442	2,462,750	2,987,875	12,753	4,274	3,973	98,510	119,515	331,594	111,115	103,420	2,561,260	3,107,390		1,595	534	497	12,314	14,940	2,707,688	15,513	384,185	2,129	497	12,314	62,147	14,940	77,087
5. Stabilization & Sediment Control Structures																																					
a. Detention Dams (Small)	Each																																				
b., Detention Dams (Medium)	Each	920	1,203	585	553	13,915	16,256	1,106,760	538,200	508,760	12,801,800	14,955,520	44,271	21,528	20,350	512,072	598,221	1,151,031	559,728	529,110	13,313,872	15,553,741	.005	5,534	2,691	2,544	64,009	74,778	14,159,443	52,911	1,331,387	8,285	2,544	64,009	466,612	74,778	541,390
c. Gully Planting	Acre																																				
d. Slope Shrub Planting	Acre																																				
e. Erosion Treatment Logged Areas	Acre	2	3,500	--	500	10,000	14,000	7,000	--	1,000	20,000	28,000	280	--	40	800	1,120	1,280	--	1,040	20,800	29,120	.005	35	--	5	100	140	26,936	104	2,080	35	5	100	874	140	1,014
Sub Total								1,113,760	538,200	509,760	12,821,800	14,983,520	44,551	21,528	20,390	512,872	599,341	1,158,311	559,728	530,150	13,334,672	15,582,861		5,569	2,691	2,549	64,109	74,918	14,186,379	53,015	1,333,467	8,320	2,549	64,109	467,486	74,918	542,404
6. Subwaterway Improvement																																					
a. Check Dams	Each	9.15	7,370	1,737	1,083	4,670	22,560	135,630	15,633	9,747	42,030	203,040	5,426	625	390	1,681	8,122	141,056	16,258	10,137	43,711	211,162	.005	678	78	49	210	1,015	184,239	5,068	21,855	756	49	210	8,446	1,015	9,461
b. Contour furrows	Acre																																				
c. Trenching	Acre																																				
d. Terraces (Flood)	Mile	250	153	74	70	1,767	2,064	38,250	18,500	17,500	441,750	516,000	1,530	740	700	17,670	20,640	39,780	19,240	18,200	459,420	536,640	.005	191	92	88	2,209	2,580	297,830	9,100	229,710	283	88	2,209	21,466	2,580	24,046
e. Seeding Flood Control Terraces	Acre	23	611	297	281	7,067	8,256	14,053	6,831	6,463	162,541	189,888	562	273	259	6,502	7,596	14,515	7,104	6,722	169,043	197,484	.005	70	34	32	813	949	109,602	3,361	84,521	104	32	813	7,899	949	8,848
Sub Total								187,933	40,964	33,710	646,321	908,928	7,518	1,638	1,349	25,853	36,358	195,451	42,502	35,059	672,174	945,285		939	204	169	3,232	4,544	591,671	17,529	335,086	1,143	169	3,232	37,811	4,544	42,355
7. Diversion Ditches & Dykes																																					
a. Water Spreading (Flood)	Acre	112	--	29	25	692	746	--	3,248	2,800	77,504	83,552	--	130	112	3,100	3,342	--	3,378	2,912	80,604	86,894	.005	--	16	14	388	418	53,387	1,165	32,242	16	14	388	3,476	418	3,894
b. Diversion Ditches	Mile	10,000	6	1	--	2	9	60,000	10,000	--	20,000	90,000	2,400	400	--	800	3,600	62,400	10,400	--	20,800	93,600	.005	300	50	--	100	450	85,280	--	8,320	350	--	100	3,744	450	4,194
c. Purchase of Water Rights											1,000	1,000									1,000	1,000		1,000				1,000	1,000				1,000			40	1,000	1,040
Sub Total								60,000	13,248	2,800	98,504	174,552	2,400	530	112	3,900	6,942	62,400	13,778	2,912	102,404	181,494		1,300	66	14	488	1,868	139,767	1,165	40,562	1,366	14	488	7,260	1,868	9,128
8. Road Erosion Control																																					
a. Roads	Mile	575	224	109	2,692		3,025	128,800	62,675	1,547,900	--	1,739,375	5,152	2,507	61,916	--	69,575	133,952	65,182	1,609,816	--	1,808,950	.005	644	314	7,739	--	8,697	1,165,024	643,926	--	958	7,739	--	72,358	8,697	81,055
b. Bridges	Each	6,000	16	7	187		210	96,000	42,000	1,122,000	--	1,260,000	3,840	1,680	44,880	--	50,400	99,840	43,680	1,166,880	--	1,310,400	.005	480	210	5,610	--	6,300	843,648	466,752	--	690	5,610	--	52,416	6,300	58,716
c. Trails	Mile																																				
Sub Total								224,800	104,675	2,669,900	--	2,999,375	8,992	4,187	106,796	--	119,975	233,792	108,862	2,776,696	--	3,119,350		1,124	524	13,349	--	14,997	2,008,672	1,110,678	--	1,648	13,349	--	124,774	14,997	139,771
9. Other Measures																																					
a. Work roads	Mile	1,000	45	2	4	--	51	45,000	2,000	4,000	--	51,000	1,800	80	160	--	2,040	46,800	2,030	4,160	--	53,040		--	--	--	--	--	51,376	1,664	--	--	--	--	1,591	--	1,591
b. Criteria Determination								116,909	8,981	12,648	228,062	366,600	--	--	--	--	--	116,909	8,981	12,648	228,062	366,600		--	--	--	--	--	366,600	--	--	--	--	--	7,332	--	7,332
Sub Total								161,909	10,981	16,648	228,062	417,600	1,800	80	160	--	2,040	163,709	11,061	16,808	228,062	419,640							417,976	1,664	--	--	--	--	8,923	--	8,923
Grand Total "A" Measures								16,749,043	1,287,510	4,376,660	30,020,837	52,434,050	665,286	51,141	174,561	1,191,671	2,082,659	17,414,329	1,338,651	4,551,221	31,212,508	54,516,709		47,232	5,200	19,188	114,552	185,172	49,682,831	1,308,181	3,525,597	52,432	19,188	114,552	1,387,255	185,172	1,573,427

TOTAL ACREAGE: 5,863,040

ESTIMATED PROGRAM COSTS IN DOLLARS -- SOUTH

PROGRAM MEASURES		Unit	Average unit cost	NUMBER OF UNITS N. F.	Other Federal	Public	Private	Total	BASE INSTALLATION COSTS N. F.	Other Federal	Public	Private	Total	INSTALLATION COSTS MAINTENANCE - INSTALLATION N. F.	Other Federal	Public	Private	Total	N. F.
		1	2	3	4	5	6	7	2x3 8	2x4 9	2x5 10	2x6 11	8+9+10+11 12	13	14	15	16	13+14+15+16 17	8+13 18
I	OPENLAND MEASURES																		
1. a.	Grassland Establishment & Imp. Reseeding (Range)	H-1	Acre	10.00	39,323	8,000	500	677	48,500	393,230	80,000	5,000	6,770	485,000					393,230
	Reseeding (Irrig.)	F-7	Acre	12.00	13,050	6,264	5,916	148,770	174,000	156,600	75,168	70,992	1,785,240	2,088,000					156,600
	Reseeding (Dry)	F-7	Acre	5.00	13,320	6,394	6,038	151,848	177,600	79,920	38,364	36,228	911,088	1,065,600					79,920
	Reseeding (Range)	F-7	Acre	4.00	1,875	900	850	21,375	25,000	7,500	3,600	3,400	85,500	100,000					7,500
b.	Fire Control (Range)	H-1	Acre	--	52,871	82,962	89,800	222,430	448,063	--	--	--	--	--	3,829	6,017	6,510	16,138	32,494	3,829
c.	Stock Driveways	H-1	Mile	200.00	50	--	--	--	50	10,000	--	--	--	10,000	2,900	--	--	--	2,900	12,900
d.	Rodent Control	H-1	Acre	.70	143,414	10,000	8,000	11,586	173,000	100,390	7,000	5,600	8,110	121,100	72,775	5,075	4,060	5,888	87,798	173,165
		F-7	Acre	1.00	637	306	289	7,268	8,500	637	306	289	7,268	8,500	914	419	420	10,542	12,325	1,551
	Sub Total									748,277	204,438	121,509	2,803,976	3,878,200	80,418	11,541	10,990	32,568	135,517	828,695
2.	Farm and Ranch Waterway Outlets																		
a.	Waterways (grass)	F-7	Acre	13.00	253	122	115	2,890	3,380	3,289	1,586	1,495	37,570	43,940					3,289
b.	Terrace Spillways (grass)	F-7	Acre	23.00	258	124	117	2,941	3,440	5,934	2,852	2,691	67,643	79,120					5,934
	Sub Total									9,223	4,438	4,186	105,213	123,060					9,223
3.	Terraces																		
a.	Seed (Dry)	F-7	Mile	130.00	1,171	562	531	13,346	15,610	152,230	73,060	69,030	1,734,980	2,029,300					152,230
b.	Pasture	F-7	Mile	77.00	450	216	204	5,130	6,000	34,650	16,632	15,708	395,010	462,000					34,650
										186,880	89,692	84,738	2,129,990	2,491,300					186,880
4.	Livestock Watering Facilities																		
a.	Ponds	H-1	Each	400.00	3	--	--	22	25	1,200	--	--	8,800	10,000	696	--	--	5,104	5,800	1,896
b.	Stock Water Dams	F-7	Each	325.00	26	13	12	299	350	8,450	4,225	3,900	97,175	113,750	4,901	2,451	2,262	56,361	65,975	13,351
c.	Wells	F-7	Each	1,000.00	4	2	2	42	50	4,000	2,000	2,000	42,000	50,000	2,320	1,160	1,160	24,360	29,000	6,320
d.	Spring Development	H-1	Each	125.00	137	--	--	43	180	17,125	--	--	5,375	22,500	9,932	--	--	3,118	13,050	27,057
e.	Spring Development	F-7	Each	400.00	30	14	14	342	400	12,000	5,600	5,600	136,800	160,000	6,960	3,248	3,248	79,344	92,800	18,960
	Sub Total									42,775	11,825	11,500	290,150	356,250	24,809	6,859	6,670	168,287	206,625	67,584
5.	Other Conservation Practices																		
a.	Fencing	H-1	Mile	700.00	692	66	48	58	864	484,400	46,200	33,600	40,600	604,800	351,190	33,495	24,360	29,435	438,480	835,590
b.	Fencing	F-7	Mile	500.00	101	49	45	1,154	1,350	50,500	24,500	23,000	577,000	675,000	36,612	17,763	16,675	418,325	489,375	87,112
c.	Contour Planting	F-7	Acre	.15	--	7,200	6,800	186,000	200,000	--	1,080	1,020	27,900	30,000						--
d.	Farm Drains	F-7	Mile	472.52	--	180	170	4,650	5,000	--	85,054	80,328	2,197,218	2,362,600	--	98,658	93,177	2,548,781	2,740,616	--
e.	Fertilizing	F-7	Acre	6.50	--	5,126	4,842	132,432	142,400	--	33,319	31,473	860,808	925,600	--	483,125	456,359	12,481,716	13,421,200	--
f.	Improvement Irrig Land Land leveling	F-7	Acre	50.00	--	9,972	9,418	257,610	277,000	--	498,600	470,900	12,880,500	13,850,000						--
	Irrig. System Imp.		Acre	20.00	--	10,296	9,724	265,980	286,000	--	205,920	194,480	5,319,600	5,720,000						--
g.	Meadow Improvement	F-7	Acre	10.00	--	180	170	4,650	5,000	--	1,800	1700	46,500	50,000						--
	Sub Total									534,900	896,473	836,501	21,950,126	24,218,000	387,802	633,041	590,571	15,478,257	17,089,671	922,702
6.	Technical Assistance	H-1	Acre	.30	1,041,786	82,962	69,800	120,166	1,314,714	312,535	24,889	20,940	36,050	394,414	604,230	48,125	40,484	69,702	762,541	916,765
a.	Technical Assistance Irrig.	F-7	Acre	5.80	--	21,698	20,493	560,538	602,729	--	125,849	118,859	3,251,120	3,495,828	--	31,465	29,710	812,784	873,959	--
b.	Technical Assistance Dry	F-7	Acre	.34	--	18,417	17,394	475,783	511,594	--	6,262	5,914	161,766	173,942	--	26,709	25,215	689,881	741,805	--
c.	Technical Assistance Range	F-7	Acre	.60	--	61,184	57,785	1,380,583	1,499,552	--	36,710	34,671	828,350	899,731	--	8,874	8,381	200,187	217,442	--
	Sub Total									312,535	193,710	180,384	4,277,286	4,963,915	604,230	115,173	103,790	1,772,554	2,595,747	916,765
II	FOREST and WOODLAND																		
1.	Insect Control	H-1	Acre	10.00	28,850	3,325	2,073	8,940	43,188	288,500	33,250	20,730	89,400	431,880	418,325	48,212	30,058	129,631	626,226	706,825
2.	Forest Planting	H-1	Acre	20.00	70,896	--	--	1,104	72,000	1,417,920	--	--	22,080	1,440,000						1,417,920
3.	Revegetation - New Burns	H-1	Acre	8.00	1,183	--	50	317	1,550	9,464	--	400	2,536	12,400	51,461	--	2,175	13,789	67,425	60,925
4.	Increased Fire Protection	H-1	Acre	.488	2,422,517	81,250	10,000	74,734	2,588,501	1,182,188	39,651	4,880	36,470	1,263,189	1,018,669	34,162	4,205	31,421	1,088,457	2,200,857
5.	Technical Supervision	H-1	Acre	.20	1,611,557	81,250	30,000	158,206	1,881,113	322,331	16,250	6,000	31,641	376,222	934,757	47,125	17,400	91,770	1,091,052	1,257,088
	Sub Total									3,220,403	89,151	32,010	182,127	3,523,691	2,423,212	129,499	53,838	256,611	2,873,160	5,643,615
	Grand Total									5,054,993	1,489,727	1,270,828	31,738,868	39,554,416	3,520,471	896,113	765,859	17,718,277	22,900,720	8,575,464

Revised 11/15/48

TOTAL ACREAGE: 5,863,040 — ESTIMATED PROGRAM COSTS IN DOLLARS -- SOUTH PLATTE WATERSHED ABOVE KERSEY, COLORADO

PROGRAM MEASURES	Unit	Average unit cost	NUMBER OF UNITS: N. F.	Other Federal	Public	Private	Total	INSTALLATION COSTS — BASE INSTALLATION COST: N. F.	Other Federal	Public	Private	Total	MAINTENANCE-INSTALLATION: N. F.	Other Federal	Public	Private	Total
	COLUMN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
FACILITATING MEASURES																		
a. Land Aquisition	Acre	12.50				572,000	572,000	--	--	--	7,150,000	7,150,000	--	--	--	--	--	--
b. Coordination								45,035	3,469	11,773	80,723	141,000	--	--	--	--	--	--
c. Program Evaluation								235,685	18,152	61,615	422,448	737,900						
d. Technical Assistance 1/			2,317,074	343,571	845,943	2,956,862	5,863,040	4,088,465	298,700	764,657	7,335,452	12,488,284	163,541	11,948	30,587	293,462	499,538
Total Facilitating Measures								4,369,185	320,321	838,045	14,989,533	20,517,184	163,541	11,948	30,587	293,462	499,538
SUMMARY																		
"A" MEASURES								16,749,043	1,287,510	4,376,660	30,020,837	52,434,050	665,286	51,141	174,561	1,191,671	2,082,659
"B" MEASURES								5,054,993	1,489,727	1,270,828	31,738,868	39,554,416	3,520,471	896,113	765,899	17,718,277	22,900,720
FACILITATING MEASURES								4,369,185	320,321	838,045	14,989,533	20,517,184	163,541	11,948	30,587	293,462	499,538
Total								26,173,221	3,097,558	6,485,533	76,749,338	112,505,650	4,349,298	959,202	971,007	19,203,413	25,482,917

PROGRAM MEASURES	TOTAL INSTALLATION COSTS: Other Federal	Public	Private	Total	ANNUAL MAINTENANCE COSTS: Rate	Other Federal	Public	Private	Total	ALLOCATION OF COSTS — INSTALLATION: Federal	Public	Private	MAINTENANCE: Federal	Public	Private	TOTAL ANNUAL COSTS: Installation (.02 x col. 32)	Maintenance (col. 28)	Total
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
FACILITATING MEASURES																			
a. Land Aquisition	--	--	7,150,000	7,150,000		--	--	--	--	--	7,150,000	--	--	--	--	--	143,000		143,000
b. Coordination	3,469	11,773	80,723	141,000							141,000	--	--	--	--	--	2,820		2,820
c. Program Evaluation	18,152	61,615	422,448	737,900							737,900	--	--				14,758		14,758
d. Technical Assistance 1/	310,648	795,244	7,629,926	12,987,822		--	--	--	--	--	12,987,822	--	--	--	--	--	259,756		259,756
Total Facilitating Measures	332,269	868,632	15,283,095	21,016,722		--	--	--	--	--	21,016,722						420,334		420,334
SUMMARY																			
"A" MEASURES	1,338,551	4,551,221	31,212,508	54,516,793		47,232	5,200	19,188	114,552	186,172	49,682,831	1,308,181	3,525,697	52,432	19,188	114,552	1,387,255	186,172	1,573,427
"B" MEASURES	2,385,840	2,036,587	49,457,145	62,459,136		242,791	61,801	58,813	1,221,950	1,579,360	17,775,633	1,700,339	42,979,154	482,451	44,090	1,092,813	1,249,101	1,573,360	2,822,461
FACILITATING MEASURES	332,269	868,632	15,283,095	21,016,722							21,016,722						420,334		420,334
Total	4,056,660	7,456,440	95,952,748	137,988,651		290,023	67,001	72,004	1,336,502	1,765,532	88,475,186	3,008,520	46,504,861	494,883	63,278	1,207,371	3,056,690	1,759,532	4,822,222

1/ Includes technical assistance, supervision, and planning and applies to "A" measures only.